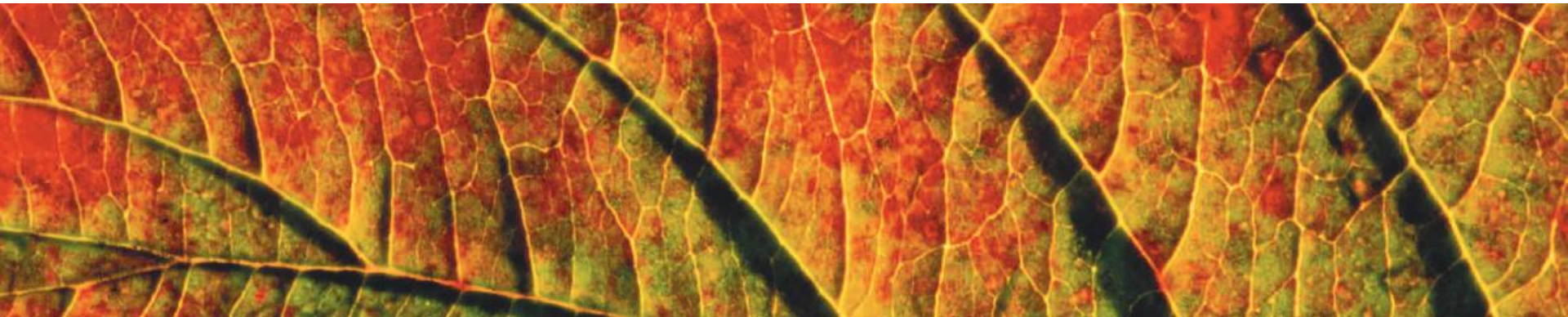


Essential Computer Concepts

Microsoft[®] Office 2010



What Is a Computer?

- A **computer** is an electronic device that accepts information and instructions from a user, manipulates the information according to the instructions, displays the information in some way, and stores the information for retrieval later

Types of Computers

- Desktop computers
- Notebook (laptop) computers
- Tablet PCs
- Subnotebook computers
- Netbooks
- Slate computers
- Handheld computers
- Smartphones
- MP3 players
- Mainframe computers
- Supercomputers

Types of Computers

Personal computers



Desktop computer



Laptop computer



Tablet PC



Netbook

Smartphone



Supercomputer



Computer Systems

- Includes computer hardware and software
 - **Hardware** refers to the physical components of a computer
 - **Software** refers to the intangible components of a computer system, particularly the **programs**, or lists of instructions, the computer needs to perform a specific task
- The design and construction of the hardware of a particular computer is referred to as its **architecture** or **configuration**
- The technical details about each component are called specifications

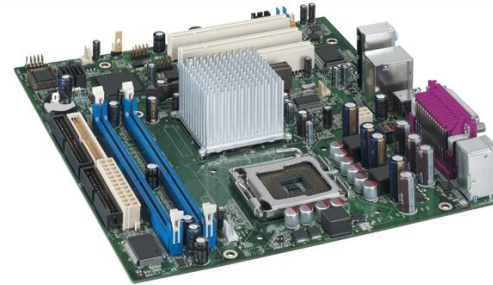
Data Representation

- **Data** refers to the words, numbers, figures, sounds, and graphics that describe people, events, things, and ideas
- **Binary digits (bits)**
- A series of eight bits is called a **byte**
 - **Kilobyte (KB or K)** = 1024 bytes
 - **Megabyte (MB)** = approx. one million bytes
 - **Gigabyte (GB)** = approx. one billion bytes
 - **Terabyte (TB)** = approx. one trillion bytes
- **ASCII**
 - **American Standard Code for Information Interchange**

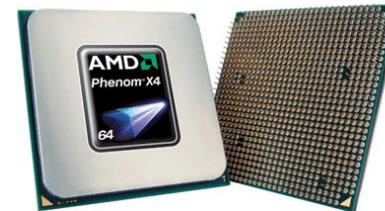
Processing Hardware

- The **motherboard** is the main electronic component of the computer
 - **Circuit board**
- The **microprocessor** is one of the most important pieces of processing hardware on the motherboard
- **Cards** are removable circuit boards

Motherboard



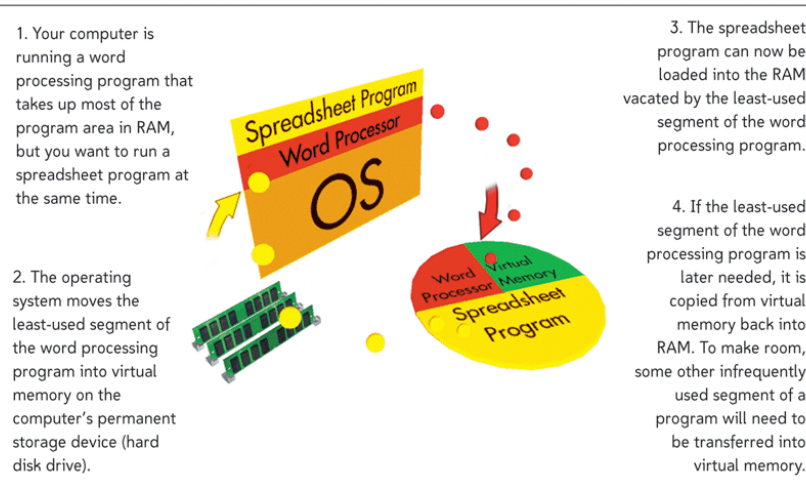
Microprocessor (front and back views)



Memory

- Random access memory (RAM)
 - Volatile memory
 - SDRAM
- Cache memory (RAM cache or CPU cache)
- Virtual memory

Figure 8 How virtual memory works



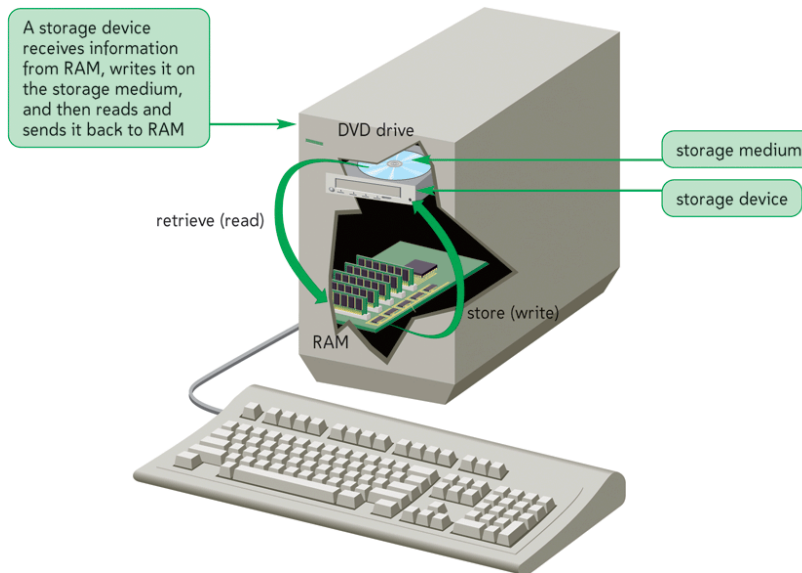
Memory

- **Read-only memory (ROM)**
 - BIOS
 - Boot process
 - Nonvolatile memory
- **Complementary metal oxide semiconductor memory (CMOS)**
- **Semipermanent memory**

Storage Media

- A computer **file** is a named collection of stored data
- An **executable file** contains the instructions that tell a computer how to perform a specific task
- A **data file** is created by a user

Figure 9 Storage and RAM



Storage Media

- Magnetic storage media
 - A hard disk contains several magnetic oxide-covered metal platters that are usually sealed in a case inside the computer

Figure 10

Storing data on magnetic media

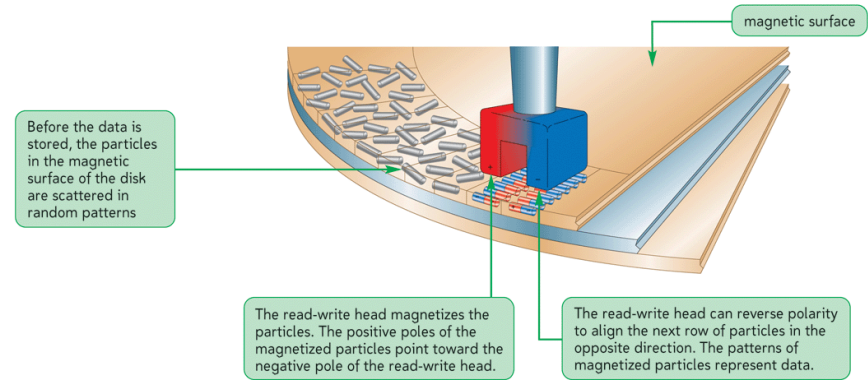


Figure 11

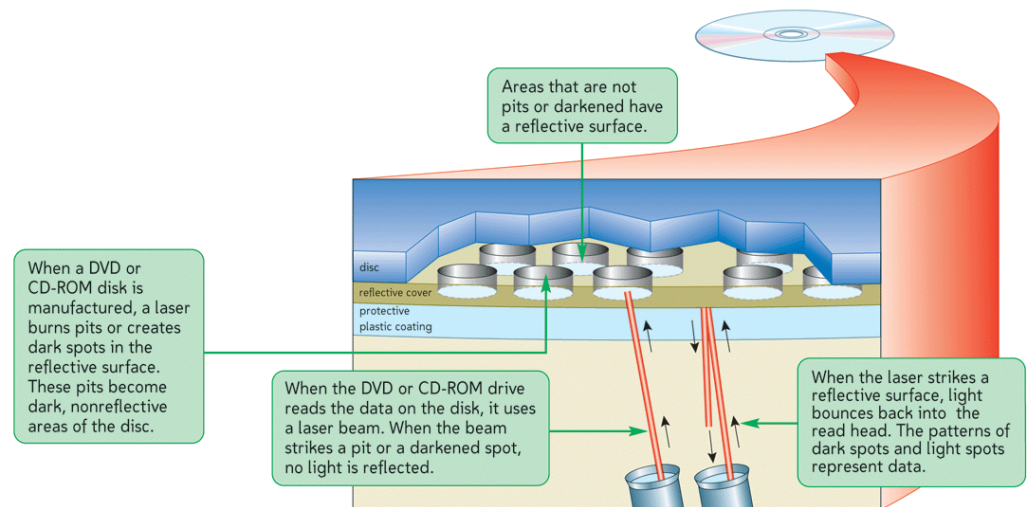
Inside a hard disk drive



Storage Media

- Optical storage device
 - CD
 - DVD
 - CD-R
 - CD-RW
 - CD-ROM
 - DVD-R
 - DVD+R
 - DVD-RW
 - DVD+RW
 - BD-RE

Figure 12 How data is stored on an optical disc



Storage Media

- Flash memory
 - Solid state storage
 - Flash memory cards
 - USB flash storage device
 - USB flash drive

Figure 13 Flash memory card



Figure 14 USB flash storage device



Input and Output

- The data or instructions you type into the computer are called **input**
- The result of the computer processing your input is referred to as **output**
- **Peripheral devices** accomplish input and output functions

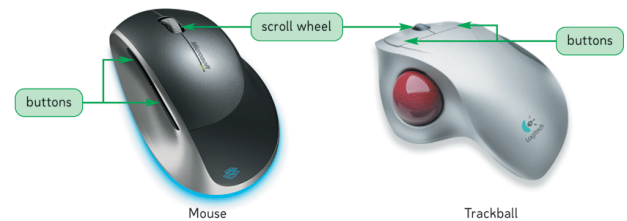
Input Devices

- You use an **input device**, such as a keyboard or a mouse, to input data and issue commands
 - Keyboard
 - Ergonomic
 - Pointing device
 - Controls the **pointer**
 - Mouse
 - Scroll wheel
 - Trackball
 - Touchpad
 - Pointing stick
 - Touchscreen
 - Scanner

15 Keyboards



Personal computer pointing devices



Notebook pointing devices



Output Devices

- **Output devices** show you the results of processing data
 - Monitor
 - **Flat panel**
 - **LCD**
 - **LED**
 - Printer
 - **Laser**
 - **Inkjet**
 - **Dot matrix**

Figure 18 LCD monitor



Figure 19 Printers



Laser printer



Inkjet printer

Data Communications

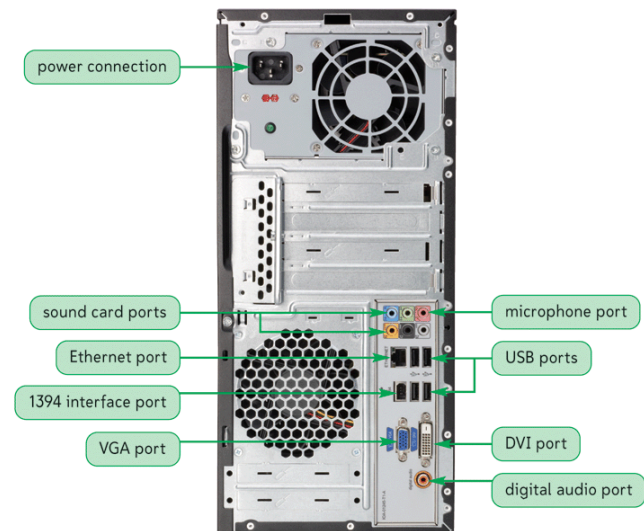
- The transmission of text, numeric, voice, or video data from one computer to another or to a peripheral device is called **data communications**
 - **Sender and receiver**
 - **Channel**
 - **Protocol**
 - **Device driver (driver)**

Data Bus

- This path between the microprocessor, RAM, and peripherals is called the **data bus**
- **Controller card**
- **Expansion card**
- **Expansion slot**

Figure 20

Computer expansion ports



Networks

- A **network** connects one computer to other computers and peripheral devices, enabling you to share data and resources with others
- **Network interface card (NIC)**
- **LAN**
- **WAN**
- **WLAN**
- **PAN**
- **WiMax**

Figure 22 Typical network configuration



Telecommunications

- **Telecommunications** means communicating over a comparatively long distance using a phone line or some other data conduit
 - Modem
 - **Digital and analog signals**
 - DSL
 - Broadband connections

The Internet

- The **Internet** is the largest network in the world, connecting millions of people
 - Email
 - World Wide Web
 - Web page
 - Web site

Figure 23

Web page on the World Wide Web

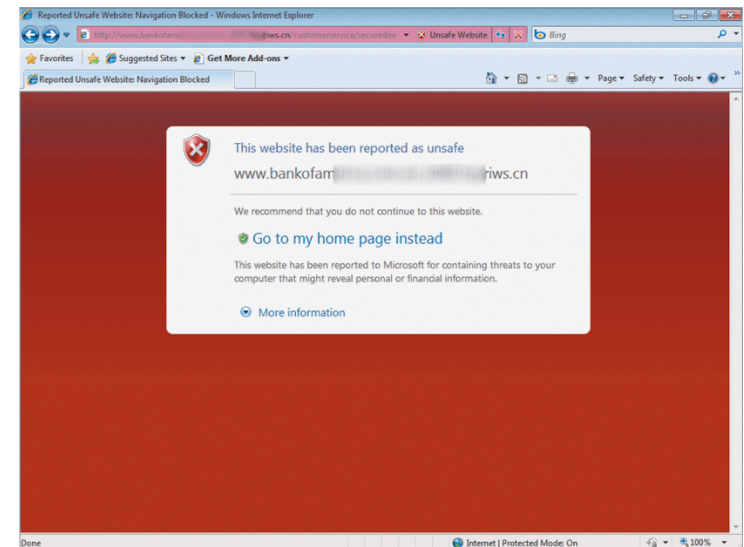


Security Threats on Your Computer

- **Security** refers to the steps a computer owner takes to prevent unauthorized use of or damage to the computer
 - **Malware**
 - **Viruses**
 - **Antivirus software**
 - **Spyware**
 - **Adware**
 - **Firewall**
 - **Spoofed site**
 - **Phishing**
 - **Pharming**

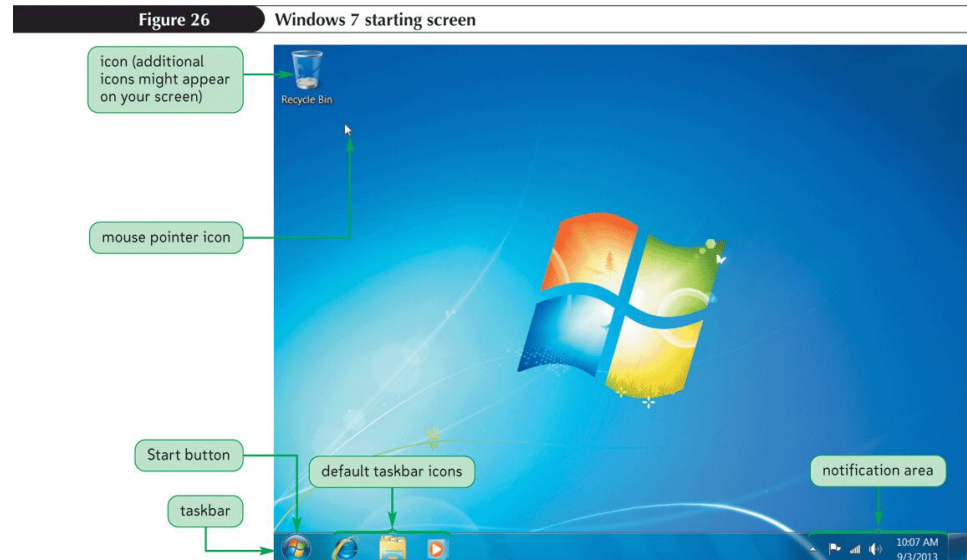
Figure 25

The Internet Explorer browser when a known spoofed site is visited



System Software

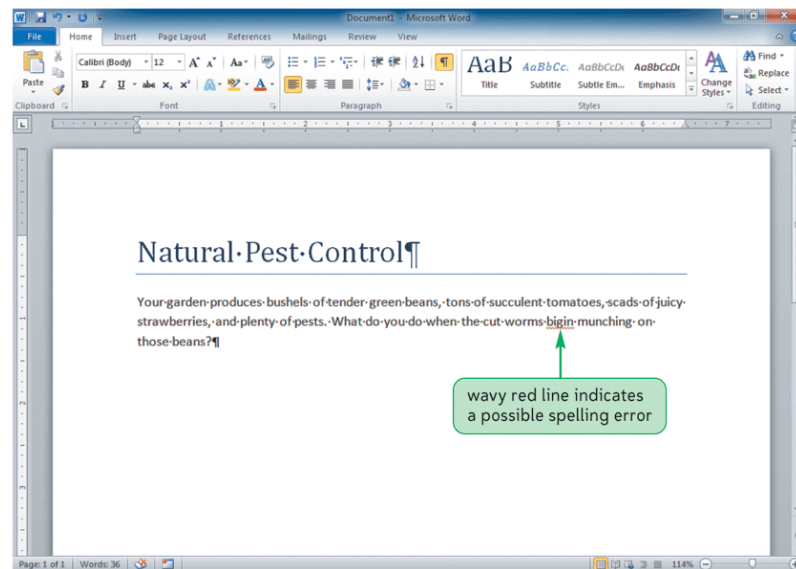
- **System software** helps the computer carry out its basic operating tasks
 - Operating system
 - **System resource**
 - **Multitasking**
 - **Utilities**
 - **Programming Languages**



Application Software

- **Application software** enables you to perform specific computer tasks, such as document production, spreadsheet calculations, and database management
 - **Document production software**

Figure 27 Checking the spelling in a document

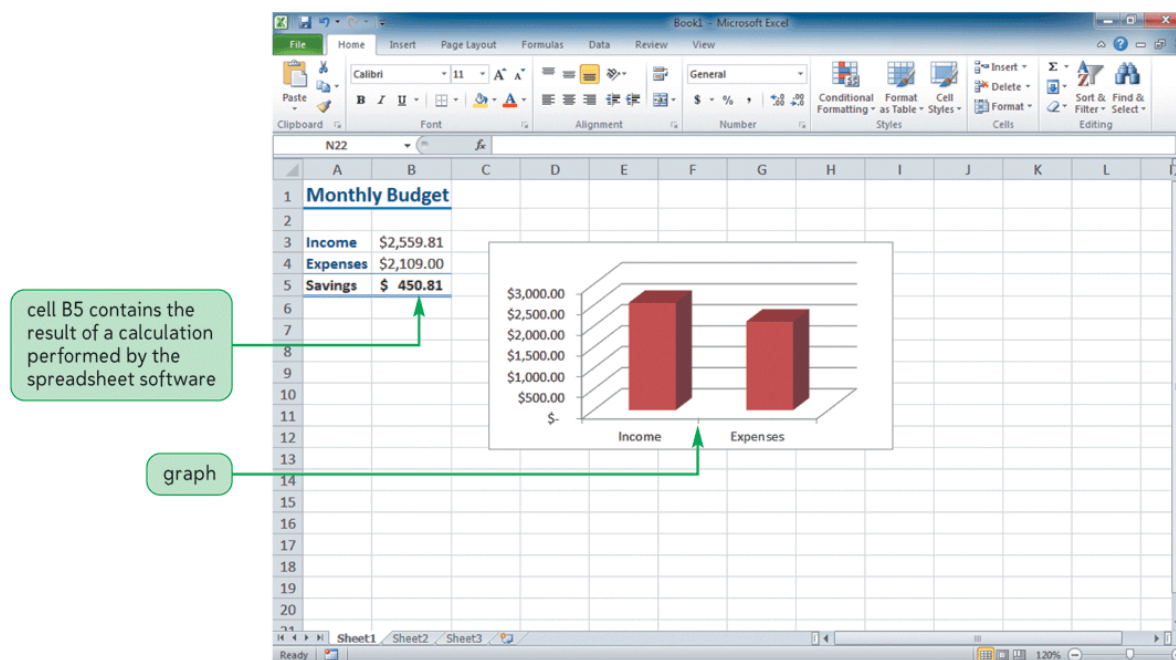


Application Software

- Web site creation and management software
- Spreadsheet software
- Database management software

Figure 28

Typical worksheet with numerical data and a graph

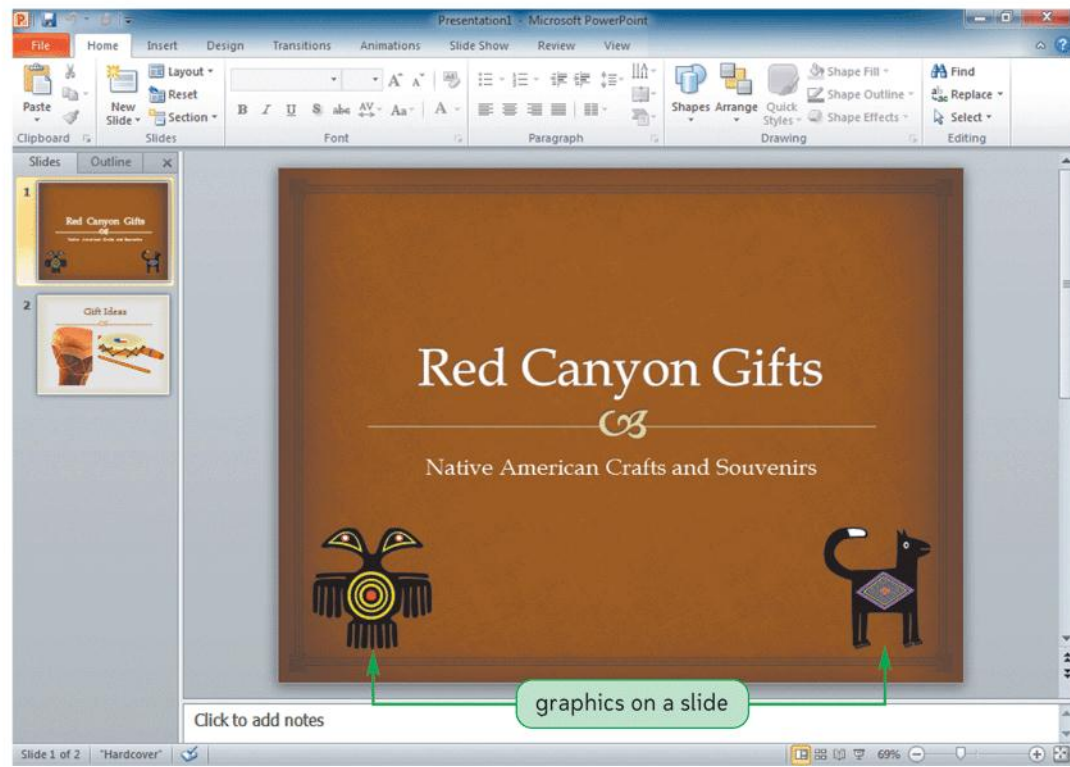


Application Software

- Presentation software

Figure 29

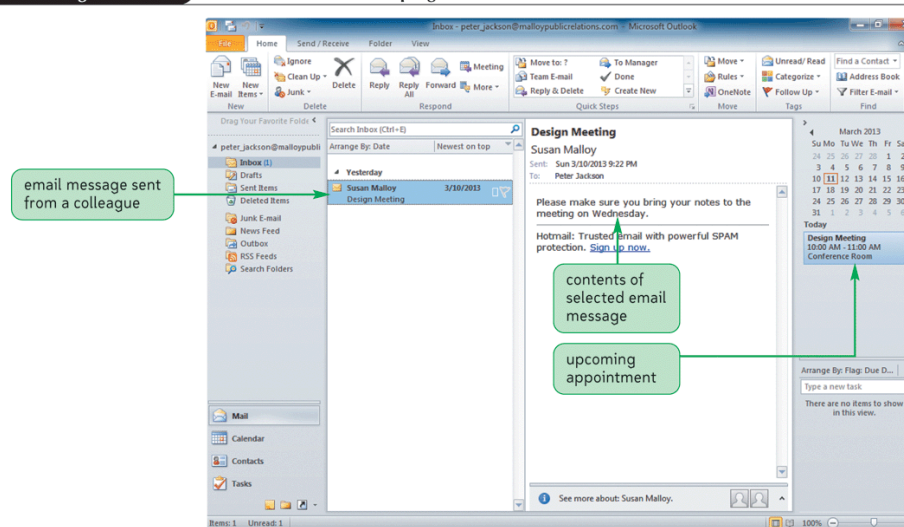
Slide in Microsoft PowerPoint 2010



Application Software

- Photo editing software
- Video editing software
- Multimedia authoring software
- Accounting software
- Information management software

Figure 30 Microsoft Outlook 2010 program window



Computing in the Cloud

- **Cloud computing** means that data, applications, and even resources are stored on servers accessed over the Internet rather than on users' computers, and you access only what you need when you need it
 - Windows Live SkyDrive

Figure 31 Windows Live Skydrive

